

课程编号：1713000840

课程名称：材料物理基础与应用

学分/学时：2/32

先修课程：《大学物理》

适用专业：理工科专业

课程性质：限选

教材：潘金生、仝健民、田民波 主编. 材料科学基础. 清华大学出版社,2011

主要参考书：

刘智恩 主编. 材料科学基础（第四版）. 西北工业大学出版社,2013

胡赓祥 主编. 材料科学基础（第三版）. 上海交通大学出版社,2010

内容简介：（600字以内）

本课程主要包括材料的原子结构及键合类型、晶体结构、晶面指数的标定方法、常见晶体结构及其几何特征、配位数、堆积因子、密排面与密排方向、高分子材料的组成和结构的基本特征、点缺陷的概念及其产生和类型、平衡浓度及对晶体性能的影响、扩散概念、扩散驱动力及扩散机制、位错的基本类型、晶粒度和晶粒尺寸的基本概念及测量、体缺陷的基本概念、相平衡与相平衡图的基本概念、非晶态材料的概念、玻璃的结构和性能等几个部分。通过教学的各个环节使学生达到各章中所提的教学要求。

Course Description

College of Science

Course Code: 1713000840

Course Name: Material Physical Basis and Application

Credit/Hours: 2/32

Textbooks: Jinsheng Pan, Jianmin Tong, Minbo Tian. Fundamentals of Materials Science. Tsinghua University Press, 2011

Reference Books:

Enzhi Liu. Fundamentals of Materials Science (Fourth Edition). Northwestern Polytechnical University Press, 2013

Gengxiang Hu. Fundamentals of Materials Science (Third Edition). Shanghai Jiao Tong University Press. 2010

Course Description:

MATERIAL PHYSICAL BASIS AND APPLICATION is a professional basis course of Applied Physics. Through studying the course to provide student a thorough understanding of the atomic structure and bonding type of materials, crystal structure, crystal plane index calibration method, common crystal structure and geometry, coordination number and packing factor, dense surface and dense row direction, polymer material composition and structure of the basic characteristics, point defect and types, the equilibrium concentration and its influence on properties of crystals, diffusion concept, driving force of diffusion and diffusion mechanism, dislocation types, the basic concept and measurement of grain size, the concept of defects, phase equilibrium and phase equilibrium diagram, the concept of amorphous materials, glass structure and properties.